

Application Number 10/533489
Response to Office Action dated 03/21/2007

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Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently Amended) A chip resistor comprising:

a ~~chip-form~~ resistor body having a front surface, and a rear surface provided at an interval in a thickness direction, and a pair of side surfaces extending in a length-fixed direction at an interval in a width direction, and a pair of end surfaces provided at an interval in the length direction; and

a plurality of electrodes provided in series on the rear surface of the resistor body at intervals in the length-fixed direction;[[,]]

a metal coating layer covering a respective one of the electrodes and a respective one of the end surfaces;

a first insulation layer covering a region between the plurality of electrodes on the rear surface of the resistor body; and

a second insulation layer covering the pair of side surfaces of the resistor body; wherein each of the electrodes and the metal coating layer overlap a portion of the first insulation layer, said portion of the first insulation layer being inserted between the metal coating layer and the rear surface of the resistor body, the metal coating layer extending beyond the respective electrode into direct contact with the first insulation layer.

~~wherein the chip resistor also comprising:~~

~~a first insulation layer covering regions between the plurality of electrodes on the rear surface of the resistor; and~~

~~a second insulation layer covering the pair of side faces of the resistor.~~

2. (Currently Amended) The chip resistor according to claim 1, further comprising a third insulation layer covering the front surface of the resistor body.

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3. (Currently Amended) The chip resistor according to claim 2, wherein at least two of the first through third insulation layers are ~~formed from~~ made of an identical material.
4. (Currently Amended) The chip resistor according to claim 2, wherein ~~the thickness of~~ each of the electrodes ~~[[is]]~~ has a greater thickness than the thickness of the first insulation layer.
5. (Currently Amended) The chip resistor according to claim 2, wherein ~~two or more electrodes are provided as~~ the plurality of electrodes comprises two or more pairs of electrodes.
6. (Currently Amended) The chip resistor according to claim 1, wherein the metal coating layer comprises a solid layer ~~the resistor comprises a pair of end faces provided at an interval in the fixed direction, and a solder layer is formed on each of the end faces.~~
7. (Currently Amended) The chip resistor according to claim 1, wherein each the plurality of the electrodes is spaced provided at a remove from a respective end surface edges of the rear surface of the resistor body in the length fixed direction.
8. (Currently Amended) A manufacturing method for ~~[[a]]~~ chip resistors each of which comprises: [[.]]
- a chip resistor body having a front surface, a rear surface provided at an interval in a thickness direction, a pair of side surfaces extending in a length direction at an interval in a width direction, and a pair of end surfaces provided at an interval in the length direction;
 - a plurality of electrodes provided in a series on the rear surface of the resistor body at intervals in the length direction;
 - a metal coating layer covering a respective one of the electrodes and a respective one of the end surfaces;

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a first insulation layer covering a region between the plurality of electrodes on the rear surface of the resistor body; and

a second insulation layer covering a pair of side surfaces of the resistor body; wherein each of the electrodes and the metal coating layer overlap a portion of the first insulation layer, said portion of the first insulation layer being inserted between the metal coating layer and the rear surface of the resistor body, the metal coating layer extending beyond the respective electrode into direct contact with the first insulation layer.

the method comprising the steps of:

producing a bar form resistor aggregate shaped into a bar, the resistor aggregate in which a plurality of electrodes is provided on a rear surface of a bar form resistor material, the plurality having a rear face provided with a multiplicity of electrodes, the multiplicity of electrodes being arranged at intervals in a longitudinal-length direction of the resistor material aggregate, and regions between the multiplicity plurality of electrodes on the rear surface face are covered with a first insulation layer, and the resistor aggregate having a pair of side surfaces of the resistor material are covered with a first and second insulation layer[[s]]; and

dividing the resistor aggregate into a plurality of chip resistors by cutting the resistor aggregate at[[in]] a plurality of locations in the longitudinal-a-length direction of the resistor aggregate thereof.

9. (Currently Amended) The manufacturing method ~~for a chip resistor~~ according to claim 8, wherein the step of producing the ~~bar form~~ resistor aggregate comprises the steps of:

providing a pattern-formed insulation layer and a conductive layer serving as the electrodes on one surface of a resistor material plate; ~~serving as a resistor material, and then~~

dividing the resistor material plate into a plurality of the bar form resistor ~~aggregates material~~; and

forming an insulation layer on the pair of side surfaces of each the bar form resistor ~~material aggregate~~.

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10. (Currently Amended) The manufacturing method ~~for a chip resistor~~ according to claim 8, wherein the step of producing the ~~bar-form~~ resistor aggregate comprises the steps of:

pattern-forming an insulation layer on one surface of a resistor material plate; ~~serving as a resistor material, and then~~ dividing the resistor material plate into a plurality of the bar-form resistor aggregates material; and

forming an insulation layer on the pair of side faces of each of the bar-form resistor aggregates material; and

forming the ~~multiplicity~~ plurality of electrodes on the rear surface of the resistor aggregate on which the pattern-formed insulation layer is formed.

11. (Currently Amended) The manufacturing method ~~for a chip resistor~~ according to claim 8, further comprising ~~a the~~ step of forming a third insulation layer covering a front surface of the ~~resistor material aggregate~~ prior to dividing the resistor aggregate into the plurality of chip resistors.

12. (Currently Amended) A manufacturing method for[[a]] chip resistors each of which comprises:[[.]]

a chip resistor body having a front surface, a rear surface provided at an interval in a thickness direction, a pair of side surfaces extending in a length direction at an interval in a width direction, and a pair of end surfaces provided at an interval in the length direction;

a plurality of electrodes provided in a series in the rear surface of the resistor body at intervals in the length direction;

a metal coating layer covering a respective one of th4e electrodes and a respective one of the end surfaces;

a first insulation layer covering a region between the plurality of electrodes on the rear surface of the resistor body; and

a second insulation layer covering the pair of side surfaces of the resistor body; wherein each of the electrodes and the metal coating layer overlap a portion of the first insulation layer, said portion of the first insulation layer being inserted between the

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metal coating layer and the rear surface of the resistor body, the metal coating layer extending beyond the respective electrode into direct contact with the first insulation layer,

the method comprising the steps of:

producing a ~~bar form~~ resistor aggregate shaped into a bar, the resistor aggregate having a rear face provided with a ~~multiplicity-plurality~~ of electrodes, the ~~multiplicity-on a rear surface of a bar form resistor material~~, the plurality of electrodes being arranged at intervals in a ~~longitudinal-length~~ direction of the resistor ~~aggregate-material~~, and a first insulation layer covering regions between the ~~multiplicity-plurality~~ of electrodes on the rear face covered with a first insulation layer;

dividing the resistor aggregate into a plurality of chip resistors ~~having protruding resistor side faces~~ by cutting the resistor aggregate at ~~[[in]]~~ a plurality of locations in a ~~longitudinal-length~~ direction ~~thereof of the resistor aggregate~~, each of the chip resistors having side surfaces; and

forming a second insulation layer on the side ~~surfaces~~ of each of the ~~resistors of the plurality of chip resistors~~.

13. (Currently Amended) A manufacturing method for ~~[[a]]~~ chip resistors each of which comprises,

a chip resistor body having a front surface, a rear surface provided at an interval in a thickness direction, a pair of side surfaces extending at a length direction at an interval in a width direction, and a pair of end surfaces provided at an interval in the length direction;

a plurality of electrodes provided in a series on the rear surface of the resistor body at intervals in the length direction;

a metal coating layer covering a respective one of the electrodes and a respective one of the end surfaces;

a first insulation layer covering a region between the plurality of electrodes on the rear surface of the resistor body; and

a second insulation layer covering the pair of side surfaces of the resistor body;

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wherein each of the electrodes and the metal coating layer overlap a portion of the first insulation layer, said portion of the first insulation layer being inserted between the metal coating layer and the rear surface of the resistor body, the metal coating layer extending beyond the respective electrode into direct contact with the first insulation layer.

the method comprising the steps of:

preparing a frame ~~of constituted by~~ a conductive ~~material member~~ comprising a plurality of ~~plate-form bar~~ portions extending in a ~~predetermined-fixed~~ direction, each ~~plate-form bar~~ portion having a front surface, a rear surface, and a pair of side surfaces, ~~and the frame also comprising~~ a support portion for supporting the plurality of ~~plate-form bar~~ portions;

producing a plurality of ~~bar-form~~ resistor aggregates by forming, on ~~either of the front surface and the rear surface of each of the plate-form bar portions~~, a multiplicity ~~plurality~~ of electrodes arranged at intervals in the ~~predetermined-fixed~~ direction and a first insulation layer positioned in regions between the plurality of electrodes, and followed by forming a second insulation layer on the pair of side surfaces of each of the ~~plate-form bar~~ portions; and

dividing each of the resistor aggregates into a plurality of chip resistors ~~such that each of the plate-form portions forms a plurality of chip-form resistors.~~

14. (Currently Amended) The manufacturing method ~~for a chip resistor~~ according to claim 13, wherein the step of forming a second insulation layer on the pair of side surfaces of each of the ~~plate-form bar~~ portions is performed after rotating the ~~plate-form bar~~ portions about a ~~length~~ longitudinal axis extending in a ~~length predetermined~~ direction thereof by twisting a connecting portion between ~~each of the plate-form the bar~~ portion ~~[[s]]~~ and the support portion of the frame ~~such that the connecting portion deforms.~~

15. (Currently Amended) The manufacturing method ~~for a chip resistor~~ according to claim 14, wherein the connecting portion of the ~~[[a]]~~ frame is in which the connecting portion is formed narrower than the plate-form ~~each bar portion is used as the frame.~~

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16. (Currently Amended) The manufacturing method ~~for a chip resistor~~ according to claim 13, further comprising a step of forming ~~[[a]]~~ the third insulation layer ~~on one of~~ the front surface ~~and the rear surface~~ of each of the ~~plate-form bar~~ portions ~~opposite to~~ the surface ~~on which the first insulation layer is formed~~, before dividing each of the resistor aggregates into the plurality of chip resistors.

17. (Currently Amended) The manufacturing method ~~for a chip resistor~~ according to claim 16, wherein the step of producing the ~~bar-form~~ resistor aggregates comprises ~~a step~~ of forming the multiplicity ~~plurality~~ of electrodes by plating ~~processing~~ after forming the first through third insulation layers on each of the ~~plate-form bar~~ portions.

18-33. (Cancelled)